

(PCT Article 36 and Rule 70)

Form PCT/IPEA/409 (cover sheet) (January 2004)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/DE2004/001328

Box No. I

Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
    - ☐ international search (Rule 12.3 and 23.1(b))
    - ☐ publication of the international application (Rule 12.4)
    - ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
  - ☐ the international application as originally filed/furnished
  - ☒ the description:
    - pages 1-13 \_\_\_\_\_ as originally filed/furnished
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  - ☒ the claims:
    - nos. \_\_\_\_\_ as originally filed/furnished
    - nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
    - nos.\* 1-21 \_\_\_\_\_ received by this Authority on 02.05.2005 with
    - nos.\* \_\_\_\_\_ received by this Authority on telefax
  - ☒ the drawings:
    - sheets 1/3-3/3 \_\_\_\_\_ as originally filed/furnished
    - sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
    - sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  - ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
  - ☐ the description, pages \_\_\_\_\_
  - ☐ the claims, nos. \_\_\_\_\_
  - ☐ the drawings, sheets/figs \_\_\_\_\_
  - ☐ the sequence listing (specify): \_\_\_\_\_
  - ☐ any table(s) related to sequence listing (specify): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - ☐ the description, pages \_\_\_\_\_
  - ☐ the claims, nos. \_\_\_\_\_
  - ☐ the drawings, sheets/figs \_\_\_\_\_
  - ☐ the sequence listing (specify): \_\_\_\_\_
  - ☐ any table(s) related to sequence listing (specify): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-21	YES
	Claims		NO
Inventive step (IS)	Claims	1-21	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-21	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
1.			
<b>This report makes reference to the following documents:</b>			
D1: US 2003/119034 A1 (PAK YUKEUN EUGENE ET AL), 26 June 2003 (2003-06-26)			
D10: SHAOMING HUANG: "Controllable 3D architectures of aligned carbon nanotube array by multi-step processes", CHEMICAL PHYSICS LETTERS 374, ELSEVIER, Vol. 374, 4 June 2003 (2003-06-04), pages 157-163			
(Document D10 was not cited in the international search report)			
2.			
<b>The application does not meet the requirements of PCT Article 33(2) and 33(3) for novelty and inventive step for the following reasons:</b>			
2.1			
The application relates to a miniaturised device (claim 1) for storing and/or enriching molecules and/or atoms, the device containing carbon nanotubes or nanofibres as			

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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filling material inside a chamber which comprises an inlet and an outlet for the supply and discharge of a molecule or atom sample.

## 2.2

Document D1, which relates to a device of this type (cf. the abstract, as well as figures 1 and 3 of D1) is regarded as the closest prior art.

## 2.3

The subject matter of claim 1 differs from D1 in that the filling material is covered with a layer of amorphous carbon, thus forming the chamber. Although a closed chamber is implicit in D1, in certain circumstances, namely when the sample is supplied under pressure or in a vacuum (cf. page 3, column 1, lines 1-6 of D1), D1 contains no indication of the structure of such a chamber. The subject matter of claim 1 is therefore novel (PCT Article 33(2)).

## 2.4

The present invention can therefore be considered to address the problem of providing a device which is specially easy to produce. This technical effect is achieved by the fact that the covering layer and the filling material can be produced in a single operation.

## 2.5

It is known that in certain circumstances a layer of amorphous carbon is produced as a by-product during the manufacture of carbon nanotubes (see, for example, document D10). However the prior art does not suggest the

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idea of using this type of layer as a component for a device according to D1. The subject matter of claim 1 is therefore inventive (PCT Article 33(3)).

2.6

The same reasoning applies to independent claim 15. The subject matter of claim 15 therefore also involves an inventive step (PCT Article 33(3)).

2.7

Claims 2-13 are dependent on claim 1, and claims 16-21 are dependent on claim 15. They therefore also meet the requirements of PCT Article 33(2) and 33(3) for novelty and inventive step.

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Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

1.

Contrary to PCT Rule 6.3(b)(ii), claims 1 and 15 are not restricted from D1.

2.

D1 is not cited in the description (PCT Rule 5.1(a)(ii)).

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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

The description was not brought into line with the claims  
(PCT Article 6).